

II. EVALUATION OF THE 1999 BAY AREA PLAN

This chapter reviews the contents of the 1999 Bay Area Plan and provides ARB staff's evaluation of each significant element.

A. EMISSION INVENTORIES AND CONFORMITY

Emissions inventories for the base year and the attainment year are fundamental elements of any air quality plan. The projected attainment year inventory must incorporate the effects of growth and existing controls to determine the expected emissions without further controls. emissions target for the attainment year. The future year inventory projections also allow calculation of the additional emission reductions needed to reach attainment by comparing those projections with emissions target for the attainment year. The attainment emissions target for each category of sources also establishes a "budget" for comparison in conformity analyses required by the Clean Air Act for new transportation plans and projects, and other federal actions or federally funded projects.

1. Overview of the 1995 Emission Inventory

U.S. EPA selected 1995 as the desired base year for the VOC and NOx emission inventory because this was the year in which the Bay Area had the highest and most numerous ozone violations. Total emissions in 1995 were 562 tpd of VOC and 626 tpd of NOx. Table II-1 shows that in the Bay Area about 40 percent of VOC emissions and 22 percent of NOx emissions are from stationary and area sources. Mobile sources account for over 60 percent of VOC emissions and about 78 percent of NOx emissions.

Table II-1				
1995 ANNUAL EMISSION INVENTORY SUMMARY				
	VOC (tpd)	Percent of Total VOC	NOx (tpd)	Percent of Total NOx
Stationary Sources	166	30	137	22
Area Sources	51	9	< 1	<1
Mobile Sources	345	61	489	78
<i>Bay Area 1995 Emissions Inventory</i>	<i>562</i>	<i>100</i>	<i>626</i>	<i>100</i>

Table II-2 shows a further breakdown of the emissions from mobile sources. On-road motor vehicles include passenger cars, minivans, sport utility vehicles, motorcycles, heavy-duty trucks, and buses. Off-road mobile sources include heavy-duty construction equipment, marine pleasurecraft, ships, aircraft, lawn and garden equipment, forklifts, pumps, and compressors.

Table II-2 1995 ANNUAL EMISSIONS INVENTORY MOBILE SOURCES*		
	VOC (tpd)	NOx (tpd)
On-Road Motor Vehicles	274	326
Off-Highway Mobile Sources	71	162
<i>1995 Mobile Sources Emissions Total</i>	<i>345</i>	<i>488</i>

*See Appendix B for further detail of the 1995 mobile source emission inventory.

Table II-3 summarizes the major categories of stationary and area source emissions for the Bay Area. The majority of the VOC emissions, 116 tpd, are from fuels distribution and solvent use. The next largest category of VOC emissions are a broad range of miscellaneous sources, including consumer products, pesticides, and fertilizer. The overwhelming majority of the NOx emissions, 124 tpd, are from fuel combustion.

Table II-3 1995 ANNUAL EMISSIONS INVENTORY STATIONARY AND AREA SOURCES*		
	VOC (tpd)	NOx (tpd)
INDUSTRIAL COMMERCIAL PROCESSES:		
Petroleum Refining Facilities	16.3	8.2
Chemical Manufacturing Facilities	3.1	2.2
Other Industrial Commercial Processes	15.8	1.4
PETROLEUM PRODUCTS/SOLVENT EVAPORATION:		
Petroleum Refinery	9.7	--
Fuels Distribution	29.3	--
Other Organic Compounds Evaporation (use of solvents)	86.8	--
COMBUSTION-STATIONARY SOURCES:		
Fuels Combustion	4.6	124.2
Burning of Waste Material	0.8	1.2
MISCELLANEOUS OTHER SOURCES (Consumer products, pesticides, and fertilizer):	50.9	0.2
<i>1995 Stationary and Area Source Emissions Total:</i>	<i>217.3</i>	<i>137.4</i>

*See Appendix A for further detail of the 1995 stationary and area source emission inventory.

We reviewed the emission inventory data that the Bay Area District compiled for 1995 and found that it is consistent with ARB's current emission inventory data.

2. 2000 Emissions Inventory

In addition to a base year inventory, attainment plans generally include an emissions inventory for the attainment year to show the projected emissions in the future year with existing controls. The attainment year inventory is also used to determine the quantity of new reductions needed. The District did not include a detailed 2000 emissions inventory in the Bay Area Plan because U.S. EPA did not require it. The attainment assessment is based on the 1995 emissions inventory grown to the year 2000. The Bay Area provided a copy of the complete inventory that underlies the attainment assessment for our evaluation. We include the detailed 2000 emissions inventory as Appendix C to this Staff Report for informational purposes since U.S. EPA did not require its submittal as part of this SIP revision.

3. Transportation Conformity and Motor Vehicle Emission Budgets

Under Section 176(c) of the federal Clean Air Act, federal funds and decisions may not support activities that contribute to violations of the national ambient air quality standards. The Act established a process, known as conformity, for assuring that federal decisions are consistent with the SIP. Transportation plans, transportation improvement programs, and transportation projects that involve federal funds must be shown to result in emissions that do not exceed estimates for motor vehicles in the SIP's progress and attainment demonstrations. This ceiling is established for on-road motor vehicles only and called the emissions budget.

The applicable transportation conformity emissions budgets for ozone (VOC and NO_x) were established in the Bay Area's 1994 Ozone Maintenance Plan, based on 1990 emission levels. The 1999 Bay Area Plan relies on significantly lower emissions from on-road motor vehicles in the 2000 attainment assessment, resulting in a need to revise the old budgets. The projected reductions are due to changes in the emissions models and from implementation of additional controls.

While U.S. EPA did not list a revised transportation conformity budget in the 1998 *Federal Register* notice as a required element of the SIP revision, it subsequently notified the Bay Area District that a new budget was necessary. The emissions budget must be derived from the 1995 emissions inventory, after accounting for the effects of growth and control. The new budget for transportation conformity will be 175 tpd VOC and 247 tpd NO_x, as shown below.

VOC budget (175.2 tpd) = 1995 on-road motor vehicle emissions (273.7 tpd) – changes to on-road motor vehicle emission categories between 1995-2000 (98.5 tpd)

NO_x budget (247.1 tpd) = 1995 on-road motor vehicle emissions (326.3 tpd) – changes to on-road motor vehicle emission categories between 1995-2000 (79.2 tpd)

Table II-4 shows that the new NO_x budget is only slightly lower than the current NO_x budget. The new VOC budget is significantly lower, but it is not likely to constrain future transportation projects because on-road motor vehicle emissions in the Bay Area are projected to decline for the foreseeable future.

Table II-4 MOTOR VEHICLE EMISSIONS BUDGETS FOR OZONE IN THE BAY AREA		
	On-Road Motor Vehicle Emissions (tpd)	
	VOC	Nox
1994 Maintenance Plan (emissions in 1990)	300	251
1999 Bay Area Plan (emissions in 2000)	175	247

The new transportation conformity budgets will become applicable when U.S. EPA makes a finding of adequacy. U.S. EPA will formalize new procedures for determining the adequacy of motor vehicle emissions budgets in response to a U.S. Court of Appeals decision in March 1999. Under these procedures, U.S. EPA will post notice of SIP submittals on its website. Within 90 days of receipt of the submittal, U.S. EPA will make a determination on the adequacy of the newly submitted budgets and post that determination on the same website. U.S. EPA staff stated that the “methodology used to derive” the emission budget as described in the Bay Area Plan is adequate to meet these requirements (6/3/99 letter from Deborah Jordan, U.S. EPA to Steve Heminger, MTC).

4. General Conformity

Section 176(c) of the federal Clean Air Act also prohibits all non-highway related federal actions from contributing to violations of the national ambient air quality standards. This requirement, known as “general conformity,” applies to federal actions and federally funded projects, such as airport expansions. Under general conformity, the federal agency proposing the applicable action must:

- estimate all emissions resulting from that action,
- compare the emissions that would occur with the action to those that would occur without the federal action, and
- make a determination whether the resulting emissions “conform” to the SIP.

If there is a net increase in emissions due to the action, the federal agency must find that the increase is below de minimis levels, consistent with the emissions projections in the applicable SIP, or fully offset by enforceable measures.

As with transportation conformity budgets, U.S. EPA has indicated that the derived 2000 emissions inventory can be used for general conformity purposes. Because it recognizes the lack of specificity in the 2000 inventory, U.S. EPA indicated that it is preferable for future actions to show conformity either by keeping emission increases below the de minimis thresholds or by fully offsetting emissions increases (6/3/99 letter from David Howekamp, U.S. EPA to Ellen Garvey, Bay Area District).

B. ATTAINMENT ASSESSMENT

Federal planning requirements usually dictate the use of an air quality model to demonstrate attainment of a standard throughout a nonattainment area, based on the emissions and control strategy identified in the SIP. U.S. EPA established a new approach for the Bay Area Plan, requiring an attainment “assessment” rather than the usual modeled attainment “demonstration.”

1. Attainment Assessment Requirements

U.S. EPA’s *Federal Register* notice requires that the Bay Area Plan include an attainment assessment using available air quality data and technical analyses to estimate the amount of emission reductions needed. The attainment assessment was also to include meteorological conditions and ambient air pollution concentrations associated with the exceedances of the ozone standard in 1995 and 1996.

2. Attainment Assessment Approach

The Bay Area District staff considered numerous options and held several public workshops to solicit comment on the best approach to use for the attainment assessment. The Bay Area District chose an approach that bases the attainment assessment on the available photochemical modeling work and other technical analyses.

The Bay Area Plan’s attainment assessment includes: (1) an analysis of the magnitude of the ozone problem in the Bay Area; (2) an examination of recent trends in ambient levels of ozone and its precursors, emission trends, spatial and temporal variations, and source-receptor relationships; and (3) the identification and application of analytical methods that can be used to predict future changes in ambient ozone resulting from changes in precursor emissions. The Bay Area District staff used Livermore peak ozone concentrations based on modeling of a September 1989 ozone episode.

To determine the amount by which the Bay Area peak ozone concentrations exceeded the standard of 124 parts per billion (ppb), the Bay Area Plan compares ozone levels to the standard at Livermore, which is the Bay Area site with the highest ozone concentrations. The design value (the fourth highest daily peak-hour ozone concentration in a three year period) for Livermore in 1995 was 138 ppb, about 10 percent above the level of the national ozone standard. Based on the 1995 design value for Livermore site and projected NO_x emission reductions for 1995 to 2000 of 92 tpd, the District staff determined the VOC reductions needed to bring the Livermore design value to 124 ppb.

3. Attainment Assessment Results

Based on the 1989 modeling, the District staff estimated that 128 tpd of VOC reductions and no additional NO_x reductions would be needed between 1995 and 2000 to meet the standard. Existing control measures adopted and being implemented by the District and ARB are projected to reduce VOC emissions by approximately 117 tpd between 1995 and 2000. The projected emissions also reflect new VOC reductions of 13.5 tpd that the District commits to achieve through permitting and enforcement actions to increase the effectiveness of refueling controls at service stations. Table II-5 shows that since the VOC reduction target is 128 tpd, an additional 11 tpd of VOC reductions are needed to attain the standard.

Table II-5 ESTIMATED REDUCTIONS NEEDED FOR ATTAINMENT IN THE BAY AREA (TPD)					
Pollutant	1995 Emissions	Estimated 2000 Emission Inventory	Emission Reductions Needed	2000 Emission Inventory with Current SIP Control Measures	Additional Emissions Needed for Attainment
VOC	562	434	128	117	11
NO _x	626	534	92	92	0

We believe the Bay Area District has met the streamlined requirements established by U.S. EPA in the July 10, 1998 *Federal Register* notice for the attainment assessment.

4. Violations in 1998

Weather in the Bay Area has a strong influence on air quality, as evidenced by the numerous violations of the standard in 1998. For areas close to the ozone standard, weather variations can make the difference between meeting and exceeding the standard in a particular year, despite steadily declining emissions. The violations in 1998 are troublesome, since the majority of the emission reductions projected to result in attainment had already been achieved. These violations emphasize the need to continue reducing emissions in the Bay Area until the standard can be attained under all weather conditions. The District's commitments in the Bay Area Plan for additional emission reductions (6.6 tpd VOC from new measures and 13.5 tpd VOC from increased enforcement at service stations) will continue progress toward this goal.

While there is technical uncertainty as to the specific reductions needed, we believe the strategies in the Bay Area Plan are a reasonable approach, given the twelve-month timeframe to develop and implement measures and the lack of an up-to-date modeling analysis. However, new local, state, and federal measures need to be pursued to ensure maintenance of the federal one-hour ozone standard and attainment of the more health-protective state ozone and particulate standards -- not just in the Bay Area, but also in downwind communities affected by Bay Area pollution.

5. Weekend Effect

The Bay Area Plan discusses a phenomenon known as the “weekend effect” -- ozone level are decreasing on all days of the week, but weekend levels are not decreasing as fast as weekday levels. The District concludes that the Bay Area ozone levels are limited by the amount of VOC emissions. ARB’s analysis also shows the existence of a weekend effect. Although there may be lower NOx emissions from heavy-duty trucks on the weekend and higher VOC emissions due to increased use of sources such as lawnmowers, marine pleasurecraft, and barbecues, there are some hypotheses for the weekend effect which do not imply that ozone formation is VOC-limited. These hypotheses are: (1) there are changes on weekends, not only in the balance of VOC and NOx emissions, but also in the specific sources, the reactivity, the location, and the timing of emissions; and/or (2) VOC and NOx emissions may carried over from heavy nighttime traffic on Friday and Saturday nights and remain the next day to form ozone. ARB is continuing to conduct and fund studies in cooperation with the air districts and industry to quantify and better understand the causes of the “weekend effect.”

C. CONTROL STRATEGY EVALUATION

The Bay Area Plan includes a control strategy to attain the national one-hour ozone standard based on both existing regulations and enforceable commitments to adopt and implement new control measures by specified dates. These rules and measures must be sufficient to achieve the emission reduction target by November 15, 2000. The Bay Area District has lead responsibility for adopting and implementing stationary and area source controls; MTC for transportation control measures; ARB for mobile sources, fuels, and consumer products; the State Bureau of Automotive Repair for vehicle inspection and maintenance; and U.S. EPA for national transportation sources.

1. Adopted Stationary Source Control Measures

Table II-6 shows the Bay Area stationary and area source rules that have already been adopted and submitted to the U.S. EPA as a SIP revision. These rules will achieve significant emission reductions between 1995 and 2000, 23 tpd of VOC and 30 tpd of NOx. These benefits are part of the baseline reductions cited in the attainment assessment.

Table II-6 DISTRICT MEASURES SUBMITTED INTO THE SIP		
Source Category	VOC Reductions (tpd 1995-2000)	NOx Reductions (tpd 1995-2000)
Miscellaneous Operations	0.3	--
Gasoline Dispensing Facilities	13.5	--
Metal Container, Closure and Coil Coating	0.6	--
Light and Medium Duty Motor Vehicle Assembly Plants	0.6	--
Valves and Flanges at Petroleum Refinery and Chemical Plants	0.7	--
Surface Coating of Misc. Metal Parts and Products	0.3	--
Graphic Arts Printing and Coating Operations	1.5	--
Pump and Compressor Seals at Petroleum Refinery and Chemical Plants	0.2	--
Semiconductor Manufacturing Operations	0.1	--
Wood Furniture and Cabinet Coatings	0.1	--
Solid Waste Disposal Sites	0.3	--
Aeration of Contaminated Soil and Removal of Underground Storage Tanks	1.0	--
Marine Vessel Loading Terminals	0.3	--
Adhesive and Sealant Products	2.5	--
Consumer Products	0.9	--
Industrial/Institutional/Commercial Boilers and Heaters	--	20.0
Stationary Internal Combustion Engines	--	4.4
Stationary Gas Turbines	--	4.9
Glass Melting Furnaces	--	0.4
TOTAL	22.9	29.7

In the Bay Area Plan, the District proposes ten additional stationary and area source control measures for inclusion in the SIP. Five of these have been adopted, but not yet submitted to U.S. EPA. Table II-7 shows these rules, which will reduce VOC emissions by 4.6 tpd.

The control measure in Table II-7 with the largest estimated emission reductions is SS-04, which requires the use of low VOC solvent cleaners. However, Measure SS-04 exempts one mineral spirits cold solvent cleaner per facility and solvent cleaners that have Bay Area District permits. ARB staff believes this rule could be made more stringent to further control VOC emissions from solvent cleaning operations by removing the current exemptions. These changes would make the Bay Area rule similar to the South Coast Air Quality Management District's current rule. Because the Bay Area District is in the process of implementing 1998 amendments to its solvent cleaning rule, we believe it will need more time to develop further revisions. We expect the District to update this rule in future plans for both state and federal purposes.

Table II-7					
ADOPTED DISTRICT MEASURES NOT YET SUBMITTED INTO THE SIP					
SIP #	Source Category	Adoption Date	Implementation Date	VOC Reduction (tpd 1995-2000)	NOx Reduction (tpd 1995-2000)
SS-01	Can and Coil Coating	11/97	1/1/98, 1/1/2000	0.35	--
SS-02	Equipment Leaks at Refineries and Chemical Plants	1/7/98	1/7/98	1.20	--
SS-03	Pressure Relief Devices	12/17/97, 3/18/98	7/1/98	0.13	--
SS-04	Solvent Cleaning	9/16/98	9/1/99	2.10	--
SS-05	Graphic Arts Operations	3/2/99	7/1/99, 1/1/2000	0.8	--
Total Emission Reductions:				4.58	--

2. Proposed Stationary Source Control Measures

As shown in Table II-8, the proposed measures that are not yet adopted will control VOC emissions from polystyrene manufacturing, refinery floating roof tanks, gasoline dispensing facilities and landfills, and contaminated soil aeration. The District estimates that these five control measures will reduce VOC emission by 6.6 tpd. Most of the emission reductions from these proposed control measures will come from the control of gasoline dispensing facilities and contaminated soil aeration.

Table II-8				
PROPOSED DISTRICT CONTROL MEASURES				
SIP #	Source Category	Adoption Date	Implementation Date	VOC Reduction (tpd 1995-2000)
SS-06	Polystyrene Manufacturing	1999	6/2000	0.26
SS-07	Low Emitting Retrofits for Slotted Guide Poles, Organic Liquid Storage	1999	6/2000	0.48
SS-08	Gasoline Dispensing Facilities	1999	6/2000	3.20
SS-09 & SS-10	Landfills & Contaminated Soil Aeration	1999	6/2000	2.68
Total Emission Reductions				6.62

Control measure SS-06, Polystyrene, Polypropylene and Polyethylene Foam Product Manufacturing, will require control of VOC emissions from specific point sources in foam product manufacturing operations. Emissions may be controlled by abatement equipment or reduction in the VOC concentration of the blowing agent. Control measure SS-07, Low Emitting Retrofits for Slotted Guide Poles, Organic Liquid Storage, will require retrofit of slotted guidepoles in large, floating roof organic liquid storage tanks equivalent to New Source Performance Standards (NSPS). Floating roof tanks are used to control emissions of organic liquids in large storage tanks typically found in refineries and bulk plants.

Control Measure SS-08, Emission Reductions from Gasoline Dispensing Facilities, will require equipment modifications to improve the efficiency of existing vapor recovery equipment. The measure would require that only vapor recovery systems compatible with federal Onboard Refueling Vapor Recovery requirements for new cars be used. The measure would set performance requirements for vapor recovery systems. It would also require pressure-vacuum valves on otherwise exempt tanks and would eliminate the Phase I vapor recovery exemption for low throughput tanks.

Control Measure SS-09, Prohibition of Contaminated Soil as Alternate Cover at Landfills, would prohibit the use of VOC-containing soil or industrial sludge as cover at landfills. It would also require treatment of VOC-contaminated soil either at the landfill or at offsite facilities. Control Measure SS-10, Prohibition of Contaminated Soil Aeration, would prohibit aeration of VOC-containing soils and require controlled treatment of contaminated soils and industrial waste sludges.

We reviewed the proposed stationary and area source control measures in the Bay Area Plan and relayed minor comments to District staff. These comments have been addressed in the proposed final Plan. Overall, we find that the proposed control measures in the Bay Area Plan and the control measures that have been adopted but not yet submitted into the SIP will result in the needed VOC emission reductions of 11 tpd.

3. Mobile Source Control Measures

The majority of emission reductions in the Bay Area anticipated to occur between 1995 and 2000 will result from ARB's mobile source control program. As shown in Table II-9, already adopted ARB control measures will result in 107 tpd VOC reductions and 90 tpd NO_x reductions in the Bay Area during this period. The program include measures for passenger vehicles, heavy-duty trucks, off-road mobile sources, and cleaner-burning gasoline. New national emissions standards for recreational boats will also provide small VOC reductions in the Bay Area by 2000.

Table II-9 MOBILE SOURCE MEASURES ALREADY REFLECTED IN SIP		
Measure (Implementing Agency)	VOC Reductions (tpd 1995-2000)	NOx Reductions (tpd 1995-2000)
On-Road Motor Vehicles – Light and Medium Duty Cars and Trucks (ARB)	94.3	66.5
On-Road Motor Vehicles – Heavy Duty Trucks (ARB)	4.2	12.7
Off-Road Vehicles and Equipment (ARB)	8.6	10.6
Gasoline-Powered Recreational Boats – Exhaust Emission Standards (U.S. EPA)	0.7	--
Total Emission Reductions:	107.8	89.8

ARB control measures for light- and medium-duty cars and trucks include the Low Emission Vehicle (LEV) program, on-board diagnostics, and cleaner burning gasoline. Heavy duty diesel truck-related measures include clean diesel fuel, lower NOx standards for trucks and buses, and the smoke inspection program. For off-road mobile sources, ARB measures include standards for diesel equipment, as well as lawn and garden equipment. New measures to reduce emissions from mobile sources will continue to come on line in the future, for example the LEV II program, a 50 percent cut in NOx emissions from new truck and buses, increasingly tighter off-road equipment standards, motorcycle regulations, and marine pleasure craft regulations, and ensure that mobile source emissions will continue to decline in the future.

The Bay Area Plan also contains one mobile source measure not already reflected in the SIP, MS-01 – Electric Golf Carts. The measure for electric golf carts was adopted by the ARB in January 1994 and required that all new golf carts purchased in federal nonattainment areas be electric beginning in 1997. Because the Bay Area was designated as attainment at that time, the measure was not implemented there. However, after the Bay Area was redesignated, ARB staff notified all Bay Area golf courses of the requirement that all new golf carts acquired on or after March 1, 2000 must be electric. Because of the short implementation period – March to November 2000, this control measure will only reduce VOCs by 0.1 tpd. However, reductions will increase in future years as the golf cart fleet turns over.

4. Transportation Control Measures

The Bay Area Plan also contains transportation control measures (TCMs) aimed at reducing motor vehicle use or activity. The TCMs are MTC's contribution to the Plan. While there has been tremendous success in reducing emissions through exhaust, evaporation, and fuel technology improvements, transportation emissions continue to be a significant cause of air pollution. This is primarily due to continuing increases in the number of vehicles and vehicle miles traveled. Although minimal emission reductions are expected from TCMs in the short term, the benefits of these measures are often realized years after adoption. Therefore, TCMs are an integral part of any plan for achieving and maintaining air quality standards.

Twenty-eight TCMs were included in the Bay Area's 1994 maintenance plan and are almost complete. Under section 110 (I) of the FCAA, control measures adopted or required prior to 1990 must remain in effect unless they are replaced with equivalent measures. The Bay Area Plan proposes to withdraw four TCMs from the Ozone SIP because they are either permanent (e.g., Guadalupe light rail line and BART Colma station) or reduce only carbon monoxide emissions. Table II-10 lists the four measures to be deleted: FTCM 6, FTCM 11, FTCM 12, and FTCM 16. The TCMs remaining in the SIP are shown in Appendix D.

Table II-10 TRANSPORTATION CONTROL MEASURES PROPOSED FOR DELETION FROM THE SIP		
TCM Id#	Control Measure Description	Reason for Deletion
FTCM 6	Continue efforts to obtain funding to support long range transit improvements	Specifically for efforts to obtain funding for construction of the Guadalupe light rail line in Santa Clara County and design work for the North Concord BART and Warm Springs extensions. These activities have been completed, and the Guadalupe light rail line is permanent.
FTCM 11	Gasoline Conservation Awareness Program	Carbon monoxide control strategy.
FTCM 12	Santa Clara Commuter Transportation Program	Carbon monoxide control strategy.
FTCM 16	Implement MTC Resolution 1876, Revised – New Rail Starts Agreement (BART Colma extension only)	BART Colma extension is complete and permanent.

5. Voluntary Control Measures

As noted above, transportation related emissions continue to be a major source of air pollution despite increasingly stringent vehicle emission standards. Many areas are exploring alternative approaches for reducing mobile source emissions, including voluntary strategies to reduce local transportation activity levels or change the in-use vehicle and engine fleet composition. Table II-11 shows the two voluntary control measures proposed in the Bay Area Plan for inclusion in the SIP: the District's "Spare the Air" program and a voluntary control measure for low-emission alternatively-fueled vehicles and infrastructure. The Bay Area Plan claims no emission reductions from these measures because of concerns about a U.S. EPA guidance policy that calls for regulatory "backstops" if voluntary measures are used for SIP credit. The District plans to document the program's effectiveness by monitoring participation in the Spare the Air program through surveys.

Table II-11 PROPOSED VOLUNTARY CONTROL MEASURES				
SIP #	Control Measure	Source Categories Affected	Implementation Date	VOC/NO_x Reductions (1995-2000)
VM-01	Spare the Air Program	Cars, pickups, lawn and garden equipment, consumer products	6/1999 – 10/1999; 6/2000 – 10/2000	No SIP Credit at this time
VM-02	Low Emission Alternately Fueled Vehicles and Infrastructure	On-road motor vehicles	1999, 2000, 20001, (depends on funding)	No SIP Credit at this time

The Spare the Air program is implemented during the “ozone season” from the beginning of June until the end of October. The program relies on public education through a comprehensive outreach effort on actions individuals can take to improve air quality on high pollution days. These actions include reducing: motor vehicle trips, use of consumer products, and use of lawn and garden equipment.

The Low Emission Alternately Fueled Vehicles and Infrastructure program is intended to facilitate and accelerate projects that replace older, more polluting vehicles with cleaner, alternative fuel vehicles. A critical element of this program is funding for the development of an infrastructure to support alternative fuels, such as CNG re-fueling and electric vehicle charging stations. Funding sources include the Congestion Mitigation and Air Quality Improvement Program, the Transportation Fund for Clean Air, the Carl Moyer Program, California Energy Commission grants, U.S. Department of Energy grants, and the private sector. The Bay Area District believes that air quality benefits can be expected over time as a result of this program.

6. Other Planned Commitments

Currently, some types and models of vapor recovery equipment are not working as envisioned, resulting in excess VOC emissions from gasoline service stations. As shown in Table II-6, District Control Measures Already Submitted into the SIP, the baseline emissions reflect VOC reductions of 13.5 tpd that the District commits to achieve through permitting and enforcement actions to increase the effectiveness of refueling controls at service stations. The District estimates that in 1995 there were approximately 15 tpd of excess VOC emissions from vapor recovery systems in the Bay Area. These excess emissions are caused by six different phenomena: (1) spit-back spillage, (2) pseudo-spillage, (3) low air to liquid ratios, (4) pressure-related fugitives, (5) idle-tip emissions, and (6) “whoosh” emissions.

- Spit-back spillage, which occurs only with bootless nozzle designs, is the forcible ejection of gasoline when the nozzle shutoff mechanism activates at the end of refueling.
- Pseudo-spillage is the evaporation of gasoline left on the atmosphere side of check valves.
- Low air-to-liquid (A/L) ratios occur when a vapor recovery system is not pulling in as much vapor volume as the gasoline volume being dispensed, thereby allowing gasoline vapor to escape to the atmosphere.
- Pressure-related fugitive emissions are caused by low A/L ratios that result in ingestion of air into underground storage tanks, which evaporates more gasoline and raises the storage tank headspace pressure.
- Idle-tip emissions, which occurred with the Emco Wheaton 4000 series nozzles, are due to releases of gasoline left in the hose beyond the check valve after fueling.
- “Whoosh” emissions are released when the gas cap on a vehicle is removed for refueling.

Excess emissions from spit-back spillage have been reduced due to federal regulations that now require the throughput to be less than 10 gallons per minute. The Bay Area District has committed to take necessary permitting and enforcement actions and to reduce the majority of the excess emissions from pseudo-spillage, low air to liquid ratios, idle-tip emissions, and pressure-related fugitives. “Whoosh” emissions are not likely to be controlled by the year 2000 because control is dependent on fleet turnover to vehicles equipped with onboard refueling vapor recovery systems.

We believe it is possible for the Bay Area District to fulfill the commitment to reduce the excess vapor recovery emissions and commend the District for committing the resources to this ambitious program. This effort will complement ARB’s current regulatory development to improve the vapor recovery program statewide. The focus of ARB’s activities is to ensure that the devices achieve the required efficiencies and to support program enhancements for additional benefits. We expect to propose new regulations at the end of the year, but implementation would not yield benefits in time for the 2000 attainment date.

D. CONTINGENCY MEASURES

As required by the Clean Air Act, the Bay Area Plan includes contingency measures that would go into effect if the area continues to violate the standard. The District included as contingency measures only adopted rules and regulations that will be implemented without further action.

Table II-12 outlines the 14 contingency measures in the Bay Area Plan and the estimated emission reductions for the post-attainment years up to 2003. Six contingency measures are District measures, one is U.S. EPA’s emission standards for gasoline-powered recreational boats, and the other seven are ARB regulations. Another ARB measure in development for Board consideration in late 1999 may provide additional benefits in this timeframe by reducing gas can spillage.

**Table II-12
PROPOSED CONTINGENCY MEASURES**

Source Category	Emission Reductions (tpd)					
	VOC (2000- 2001)	VOC (2000- 2002)	VOC (2000- 2003)	NO _x (2000- 2001)	NO _x (2000- 2002)	NO _x (2000- 2003)
<i>Adopted measures already in the SIP:</i>						
Gasoline Dispensing Facilities (Rule 8-7)	0.5	0.9	1.1	--	--	--
Graphic Arts Printing and Coating Operations (Rule 8-20)	0.8	0.7	0.7	--	--	--
Aeration of Contaminated Soil and Removal of Underground Storage Tanks (Rule 8-40)	0.5	1.0	1.5	--	--	--
On Road Motor Vehicles – Light and Med. Duty Cars and Trucks (ARB)	14.4	26.8	39.1	16.8	26.4	35.3
On Road Motor Vehicles – Heavy Duty Trucks (ARB)	0.1	0.5	0.7	3.3	5.0	6.7
Off Road Vehicles (ARB)	0.1	0.1	0.2	3.8	7.8	9.5
Gasoline-powered Recreational Boats (U.S. EPA)	0.7	1.6	3.6	(0.1)	(0.1)	(0.2)
Stationary Internal Combustion Engines (Rule 9-8)	--	--	--	1.0	1.0	0.9
Stationary Gas Turbines (Rule 9-9)	--	--	--	0.9	0.9	0.8
Glass Melting Furnaces (Rule 9-12)	--	--	--	0.2	0.2	0.1
<i>Adopted Measures not yet incorporated into the SIP for the Bay Area:</i>						
Consumer Products Mid-term Measures – Part 1 (ARB)	0.6	1.8	2.6	--	--	--
Marine Pleasure Craft (ARB)	0.3	0.7	1.6	0.0	(0.1)	(0.2)
Electric Golf Carts (ARB)	0.1	0.2	0.3	--	--	--
Off Road Spark Ignition Engines (ARB)	0.0	0.2	0.4	0.2	0.9	2.0
Total Emission Reductions:	18.1	34.5	51.8	26.1	42.0	54.9

Most of the contingency measures are adopted and have already been submitted into the SIP. Four of the contingency measures that are adopted but have not received SIP credit for the Bay Area are Consumer Products Mid-term Measures – Part 1, Emission Reductions from Marine Pleasure Craft, Electric Golf Carts, and Off-Road Spark Ignition Engine Controls. All of these will be implemented by the ARB.

The Consumer Products Mid-term Measures – Part 1, adopted in July 1997, sets limits on the VOC content of a number of consumer products, including automotive polishing compounds, carpet and upholstery cleaners, degreasers, heavy-duty hand cleaners, metal cleansers, lubricants, herbicides, paint strippers, and spot removers. The standards will become effective on dates ranging from January 1, 2001 to January 1, 2005. The cumulative VOC emission reductions expected in the Bay Area as a result of this regulation is 0.6 tpd in 2001, 1.8 tpd in 2002, and 2.6 tpd in 2003.

The Marine Pleasurecraft regulation, adopted by the ARB in December 1998, consists of new emission standards for gasoline-powered marine engines, including outboard motors and personal watercraft. The standards apply to new marine engines manufactured starting with the 2001 model year. Under the regulation, a typical marine engine will be 75 percent cleaner by 2001 and 90 percent cleaner by 2008. This regulation is expected to reduce VOCs by 1.6 tpd in 2003 in the Bay Area. A small increase in NOx emissions of 0.2 tpd is also expected.

Reductions of VOC emissions from ARB's Electric Golf Carts regulation will increase in future years as the golf cart fleet turns over.

The Off-Road Spark Ignition Engine Controls regulation contains emission standards for engines 25 horsepower or above. The standards apply to equipment such as forklifts, portable generators, large turf care equipment, scrubbers/sweepers, airport ground support equipment, and general industrial equipment. Construction and farm equipment engines below 175 horsepower, marine propulsion engines, locomotives, and recreational vehicles are excluded. Implementation of the rule begins in 2001 for engines with a displacement greater than 1.0 liter, and 2002 for engines 1.0 liter and below. Emission reductions as a result of this rule are 0.36 tpd of VOCs and 1.95 tpd of NOx.

We reviewed the contingency measures in the Bay Area Plan and relayed minor comments related to the estimates of emission reductions and the cost effectiveness of the measures to District staff. These comments have been addressed in the proposed final Plan. ARB staff believes that the proposed contingency measures will result in the estimated emission reductions.